

IN THE CLAIMS:

Claims 1-10, 12, 13, and 21-30 have been amended herein. New claims 31-63 have been added herein. All of the pending claims 1 through 63 are presented below. This listing of claims will replace all prior versions and listings of claims in the application. Please enter these claims as amended.

Listing of the Claims:

1. (Currently Amended) An isolated thymidylate synthase (thyA) mutant of a strain of *Lactococcus* species, said thyA mutant comprising:

a defective thymidylate synthase gene;

~~wherein said thymidylate synthase gene is selected from the group consisting of SEQ ID NO: 3 and SEQ ID NO: 5 wherein said strain of Lactococcus species comprises a thymidylate synthase gene comprising~~

at least 100 contiguous nucleotides that are at least 90% identical to a region of SEQ ID NO: 1; and

at least 100 contiguous nucleotides that are at least 90% identical to a region of SEQ ID NO: 2.

2. (Currently Amended) The isolated thymidylate synthase (thyA) mutant of a strain of *Lactococcus* species of claim 1, wherein said defective thymidylate synthase gene has been inactivated by gene disruption.

3. (Currently Amended) The isolated thymidylate synthase (thyA) mutant of a strain of *Lactococcus* species of claim 1, wherein the *Lactococcus* species is *Lactococcus lactis*.

4. (Currently Amended) The isolated thymidylate synthase (thyA) mutant of a strain of *Lactococcus* species of claim 2, wherein the *Lactococcus* species is *Lactococcus lactis*.

5. (Currently Amended) ~~A transformed~~ The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species of claim 1, wherein said (*thyA*) mutant *Lactococcus* species comprising a defective thymidylate synthase gene, and further comprising a is transformed with a transforming plasmid,

~~wherein said thymidylate synthase gene is selected from the group consisting of SEQ ID NO: 3 and SEQ ID NO: 5; and~~

wherein said transforming plasmid does not comprise an ~~intact-~~ functional thymidylate synthase gene.

6. (Currently Amended) ~~The transformed~~ The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species of claim 5, further comprising a gene encoding a molecule of interest.

7. (Currently Amended) ~~The transformed~~ The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species of claim 5, wherein said molecule of interest is Interleukin-10.

8. (Currently Amended) ~~The transformed~~ The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species of claim 5, wherein said *Lactococcus* species is *Lactococcus lactis*.

9. (Currently Amended) ~~The transformed~~ The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species of claim 8, wherein the *Lactococcus lactis* comprises a gene encoding a molecule of interest.

10. (Currently Amended) ~~The transformed~~ The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species of claim 9, wherein the molecule of interest is Interleukin-10.

11. (Withdrawn) A method for delivering a molecule of interest to a subject, said method comprising administering the transformed strain of *Lactococcus* species of claim 6 to the subject.

12. (Currently Amended) A composition comprising:

~~a transformed strain of *Lactococcus* species comprising a defective thymidylate synthase gene, and further comprising a transforming plasmid, wherein said thymidylate synthase gene is selected from the group consisting of SEQ ID NO: 3 and SEQ ID NO: 5; and~~

~~wherein said transforming plasmid does not have comprise an intact thymidylate synthase gene~~ the isolated thymidylate synthase (*thyA*) mutant of a strain of a *Lactococcus* species of claim 5.

13. (Currently Amended) The composition of claim 12, wherein ~~the *Lactococcus* species~~ the isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species further comprises a gene encoding a molecule of interest.

14. (Original) The composition of claim 13, wherein said molecule of interest is Interleukin-10.

15. (Original) The composition of claim 12, wherein said *Lactococcus* species is *Lactococcus lactis*.

16. (Original) The composition of claim 15, wherein the *Lactococcus lactis* comprises a gene encoding a molecule of interest.

17. (Original) The composition of claim 16, wherein the molecule of interest is Interleukin-10.

18. (Withdrawn) A method of treating inflammatory bowel disease in a subject, said method comprising:

administering to the subject a transformed strain of *Lactococcus* species of claim 6.

19. (Withdrawn) The method of claim 18, wherein the molecule of interest is Interleukin-10.

20. (Withdrawn) A method for delivering a molecule of interest to a subject, said method comprising administering the transformed strain of *Lactococcus* species of claim 9 to the subject.

21. (Currently amended) An isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* bacterium, said *thyA* mutant comprising:

a genome, and, incorporated into said genome, a means for encoding a defective thymidylate synthase gene; and

wherein said genome has been genetically modified ~~in comparison to wild type *Lactococcus* through introducing a defect in said *thyA*.~~

22. (Currently amended) The isolated *Lactococcus* bacterium thymidylate synthase (*thyA*) mutant of claim 21, wherein ~~the means for encoding a defective thymidylate synthase gene comprises a thymidylate synthase gene selected from the group consisting of SEQ ID NO: 3 and SEQ ID NO: 5~~ said strain of *Lactococcus* bacterium comprises a thymidylate synthase gene selected from the group consisting of SEQ ID NO: 3 and SEQ ID NO: 5.

23. (Currently amended) The isolated *Lactococcus* bacterium thymidylate synthase (*thyA*) mutant of claim 21, wherein the *Lactococcus* bacterium is a *Lactococcus lactis* bacterium.

24. (Currently amended) The isolated *Laetococcus* bacterium thymidylate synthase (thyA) mutant of claim 21, further comprising a transforming plasmid; and

wherein said transforming plasmid does not comprise an intact thymidylate synthase gene.

25. (Currently amended) The isolated *Laetococcus* bacterium thymidylate synthase (thyA) mutant of claim 24, further comprising a gene encoding a molecule of interest.

26. (Currently amended) The isolated *Laetococcus* bacterium thymidylate synthase (thyA) mutant of claim 25, wherein said molecule of interest is Interleukin-10.

27. (Currently amended) The isolated *Laetococcus* bacterium thymidylate synthase (thyA) mutant of claim 24, wherein said *Lactococcus* bacterium is a *Lactococcus lactis* bacterium.

28. (Currently amended) The isolated *Laetococcus* bacterium thymidylate synthase (thyA) mutant of claim 27, wherein the *Lactococcus lactis* bacterium comprises a gene encoding a molecule of interest.

29. (Currently amended) The isolated *Laetococcus* bacterium thymidylate synthase (thyA) mutant of claim 28, wherein the molecule of interest is Interleukin-10.

30. (Currently amended) A composition comprising: the isolated *Laetococcus* bacterium thymidylate synthase (thyA) mutant of claim 21.

31. (New) The isolated *thyA* mutant of a strain of *Lactococcus* species of claim 1, wherein said strain of *Lactococcus* species comprises a thymidylate synthase gene selected from the group consisting of SEQ ID NO: 3 and SEQ ID NO: 5.

32. (New) An isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species, said *thyA* mutant produced by a process comprising:

providing a strain of *Lactococcus* species comprising thymidylate synthase gene comprising

at least 100 contiguous nucleotides that are at least 90% identical to a region of SEQ ID NO: 1; and

at least 100 contiguous nucleotides that are at least 90% identical to a region of SEQ ID NO:2; and

introducing a defect in said thymidylate synthase gene.

33. (New) The isolated *thyA* mutant of a strain of *Lactococcus* species according to claim 32, wherein said thymidylate synthase gene is selected from the group consisting of SEQ ID NO: 3 and SEQ ID NO: 5 and introducing a defect in said thymidylate synthase gene.

34. (New) The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species according to claim 32, wherein said defective thymidylate synthase gene has been inactivated by gene disruption.

35. (New) The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species according to claim 32, wherein the *Lactococcus* species is *Lactococcus lactis*.

36. (New) The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species according to claim 34, wherein the *Lactococcus* species is *Lactococcus lactis*.

37. (New) The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species according to claim 32, wherein said (*thyA*) mutant is transformed with a transforming plasmid,

wherein said transforming plasmid does not comprise an intact thymidylate synthase gene.

38. (New) The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species according to claim 37, further comprising a gene encoding a molecule of interest.

39. (New) The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species according to claim 37, wherein said molecule of interest is Interleukin-10.

40. (New) The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species according to claim 37, wherein said *Lactococcus* species is *Lactococcus lactis*.

41. (New) The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species according to claim 40, wherein the *Lactococcus lactis* comprises a gene encoding a molecule of interest.

42. (New) The isolated thymidylate synthase (*thyA*) mutant of a strain of *Lactococcus* species according to claim 41, wherein the molecule of interest is Interleukin-10.

43. (New) An isolated thymidylate synthase (*thyA*) mutant of a *Lactococcus* bacterium, said *thyA* mutant comprising a defective thymidylate synthase gene, wherein said defective thymidylate synthase gene has been genetically modified through introducing a defect in said thymidylate synthase gene.

44. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 43, wherein the defective thymidylate synthase gene has been inactivated by gene disruption.

45. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 43, wherein the *Lactococcus* bacterium is a *Lactococcus lactis* bacterium.

46. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 43, further comprising a transforming plasmid; and wherein said transforming plasmid does not comprise an intact thymidylate synthase gene.

47. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 46, further comprising a gene encoding a molecule of interest.

48. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 47, wherein said gene encoding a molecule of interest is integrated within the defective thymidylate synthase gene.

49. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 47, wherein said gene encoding a molecule of interest replaces a part of or the entire thymidylate synthase gene of said *Lactococcus* bacterium.

50. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 48, wherein said molecule of interest is a prophylactic or therapeutic molecule.

51. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 49, wherein said molecule of interest is a prophylactic or therapeutic molecule.

52. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 47, wherein said molecule of interest is Interleukin-10.

53. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 46, wherein said *Lactococcus* bacterium is a *Lactococcus lactis* bacterium.

54. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 53, wherein the *Lactococcus lactis* bacterium comprises a gene encoding a molecule of interest.

55. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 54, wherein said gene encoding a molecule of interest is integrated within the defective thymidylate synthase gene.

56. The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 54, wherein said gene encoding a molecule of interest replaces a part of or the entire thymidylate synthase gene of said *Lactococcus* bacterium.

57. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 55, wherein said molecule of interest is a prophylactic or therapeutic molecule.

58. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 56, wherein said molecule of interest is a prophylactic or therapeutic molecule.

59. (New) The isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 54, wherein the molecule of interest is Interleukin-10.

60. (New) A composition comprising the isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 43.

61. (New) A pharmaceutical composition comprising the isolated *thyA* mutant of a *Lactococcus* bacterium according to claim 43.

62. (New) An improvement in isolated *Lactococcus* bacterium comprising SEQ ID NO:3 or SEQ ID NO:5, wherein the improvement comprises:
a defect in SEQ ID NO:3 or SEQ ID NO:5

63. (New) An improvement in isolated *Lactococcus* bacterium comprising SEQ ID NO:3 or SEQ ID NO:5, wherein the improvement comprises:
a defective thymidylate synthase.